FAIRCHAIN

Improving food system sustainability through technological, social, and organizational innovations in intermediate food value chains

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EFFoST Conference 2021

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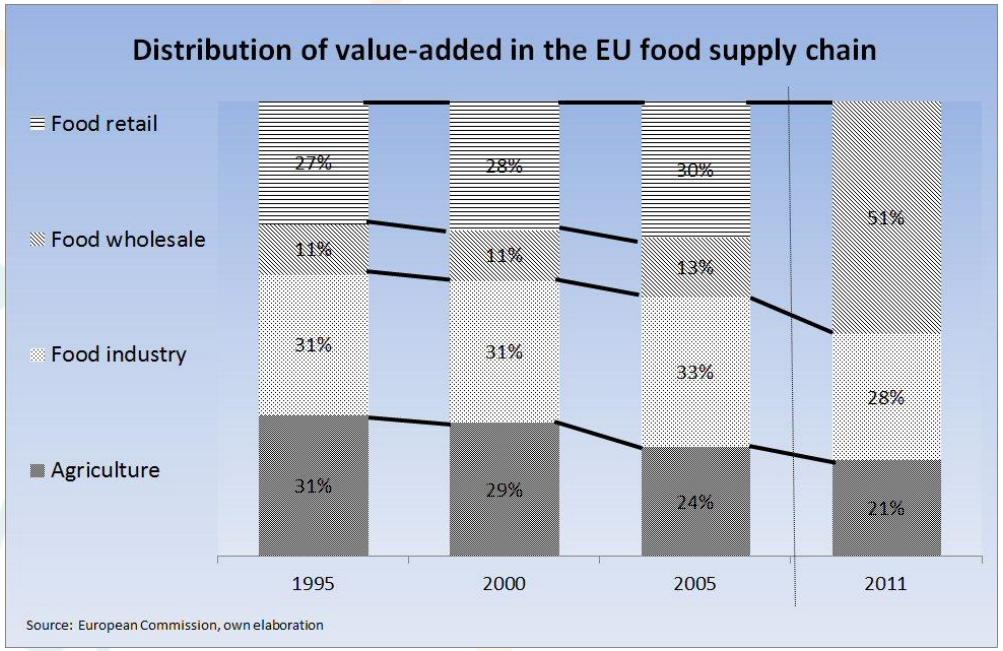
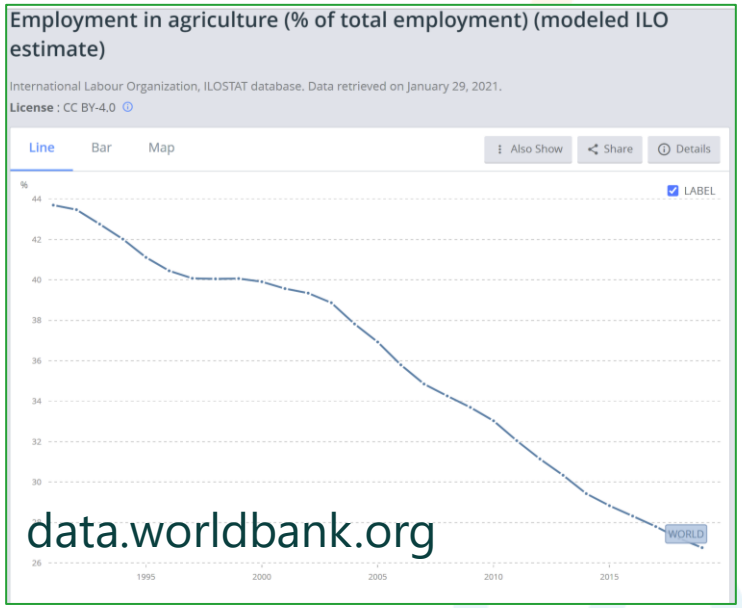
Food systems contribute to societal problems.

- **ECONOMIC**

Unbalanced distribution of wealth: Agriculture receives 21 % of the value in EU food chains; 51% goes to food retail and food services





- **SOCIAL**

Rural employment declining: Between 2005 and 2017, the agricultural workforce decreased by 25% and is expected to decline *a further 28%* between 2017 and 2030

Food systems contribute to societal problems

- **ENVIRONMENTAL**

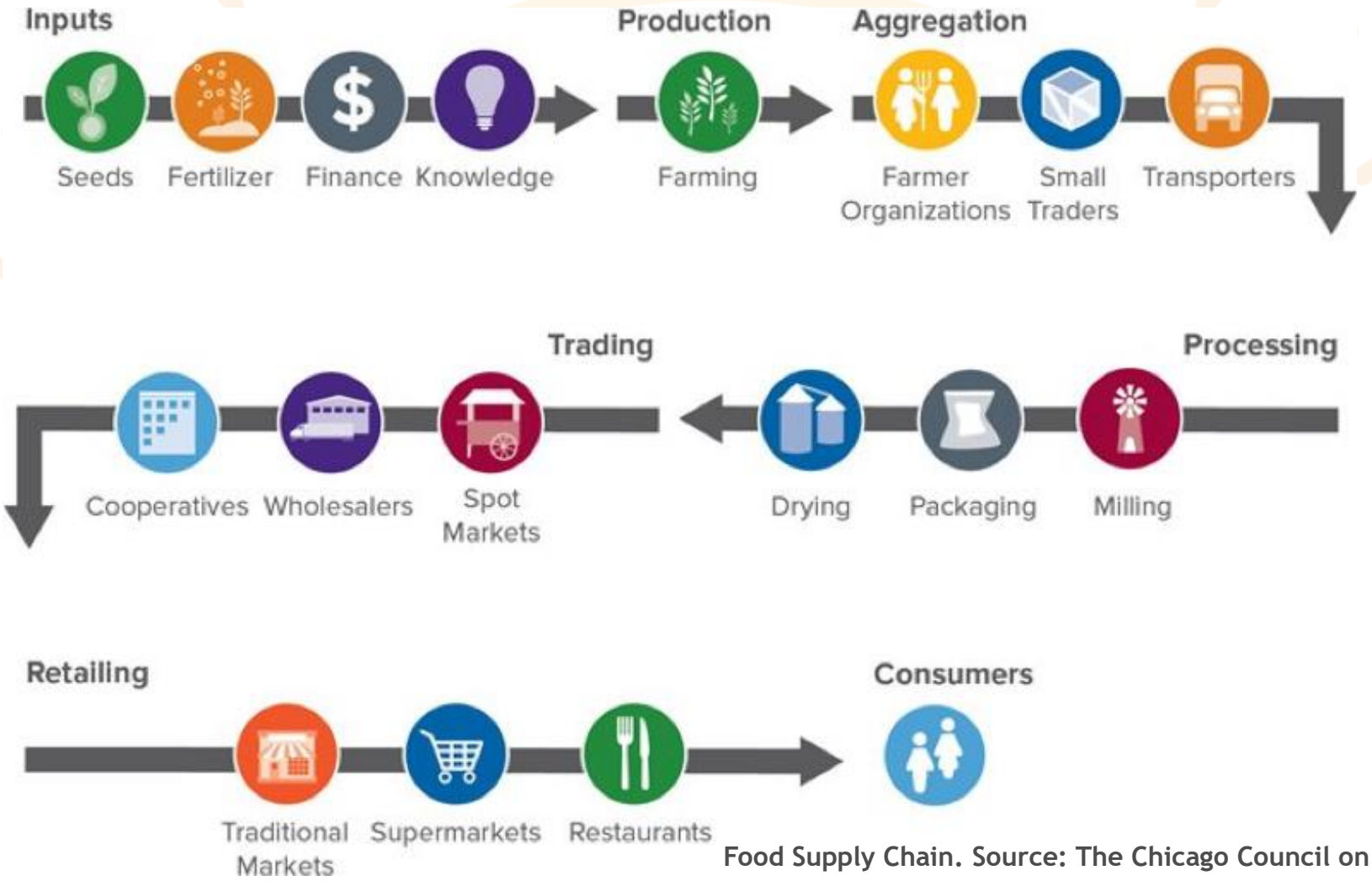
Increased Packaging and Waste: Europeans will use 953 billion food packages in 2018-2020. (UNEP, Plastic waste causes financial damage of US$13 Billion to marine ecosystems each year as concern grows over microplastics, 2014)

https://www.health.harvard.edu/blog/what-are-ultra-processed-foods-and-are-they-bad-for-our-health-2020010918605

- **HEALTH**

'Ultra-processed' food linked to obesity and cancer: Due to product composition (e.g. high salt, sugar, fat), additives, or neo-formed components (Srour, B. et al. (2019), British Medical Journal, 365, n°1451)

Dominant long food supply chains



Food Supply Chain. Source: The Chicago Council on Global Affairs

Dominant long food supply chains

- Profit concentration
- Rural areas decline
- Environmental damage
- Highly processed products

- Lower prices
- One-stop shopping
- Long shopping hours
- Easily accessible location
- Large choice of products

- Low paying service jobs (Uber Eats)
- Increased rural poverty
- Factory farms, deforestation
- Non-communicable (diet-related) diseases

- Strong economic activity
- Resource efficiency
- Economies of scale, mass production

Trendy short food supply chains

Trendy short food supply chains (SFSC)

- Geographical proximity
- Fairer price for farmers
- Creation of local jobs

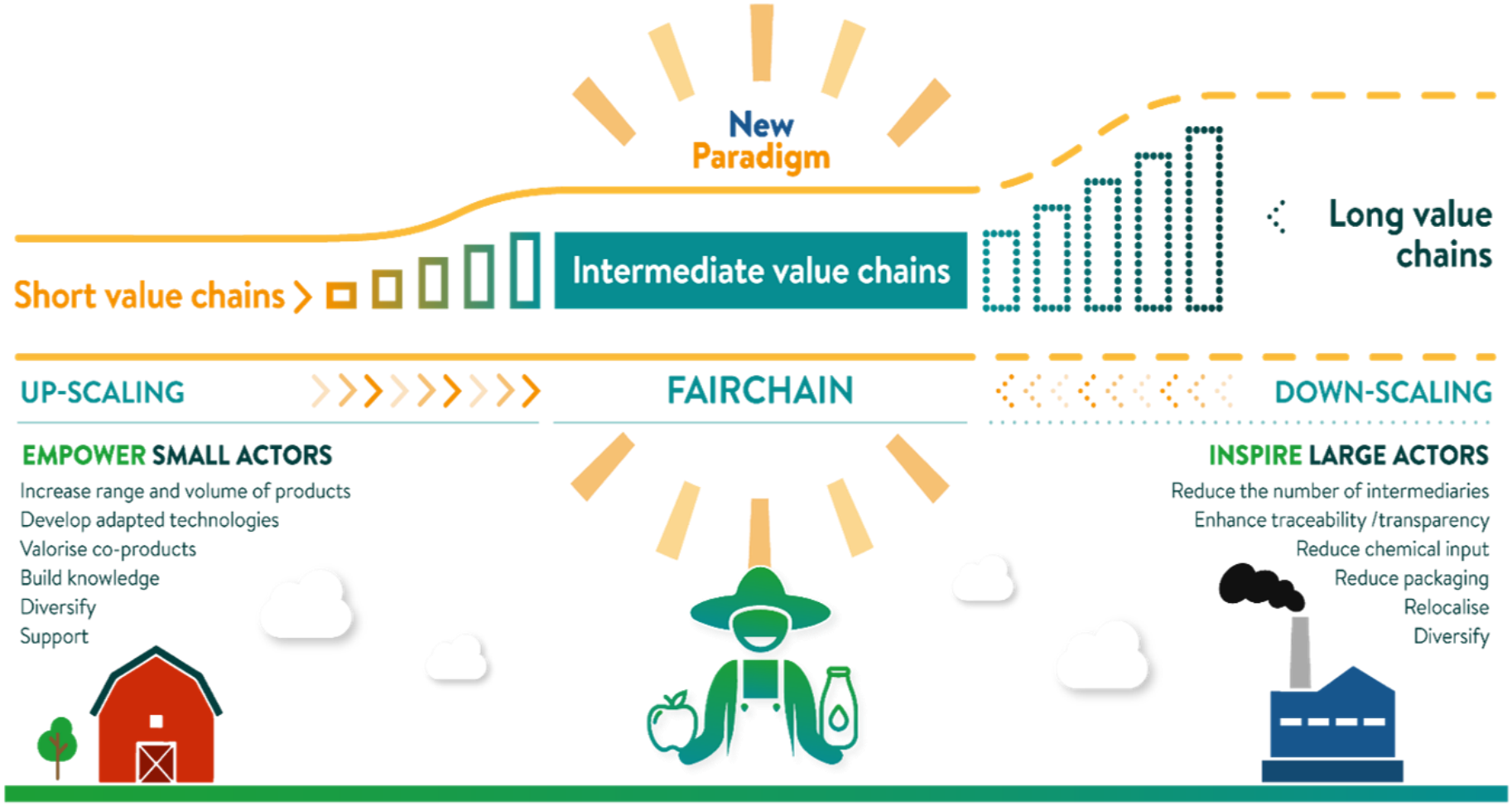
- Fresh, minimally processed food
- Traceability
- Seasonal food
- Personal relationship between producer & consumer

- Insufficient production volumes
- Higher prices
- Limited distribution locations
- Limited distribution times

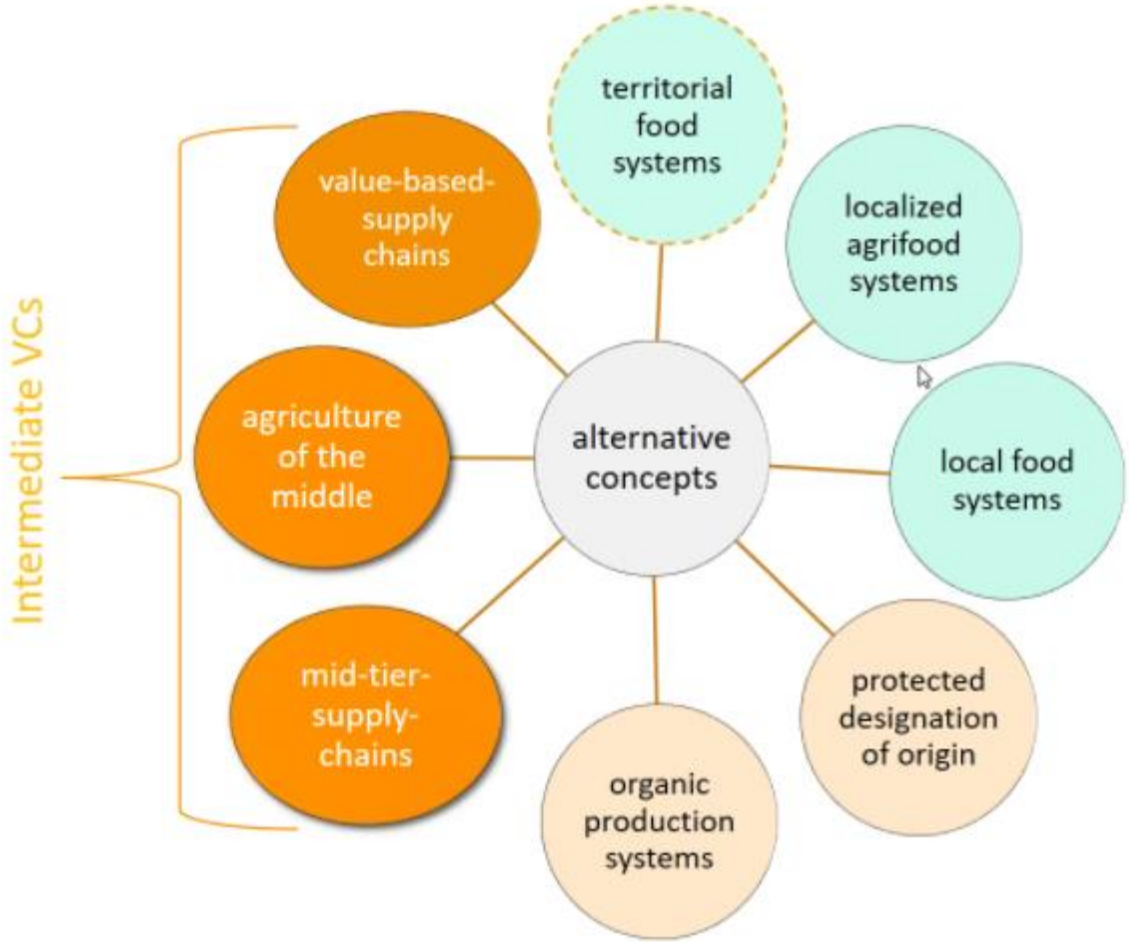
Nom de l'adhérent : FLYNN

Volailles et œufs			Livraison mensuelle		
Contact producteur : Ferme avicole, La Roche Chalais, 05 53 91 30 26 06 37 62 90 29					
		PRIX	27-avr	25-mai	22-juin
6 œufs	EF	2€30	2.30	2,30	2,30
30 œufs	PLAT	7€10			
1 poulet moyen (1,8kg)	POM	16€20	16,20	16,20	
1 poulet gros (2,1kg)	POG	18€90			
1 poulet très gros (2,4kg)	POTG	21€50			
1 pintade (1,8kg)	PI	19€50			
1 lapin (1,7kg)	LAP	19€75			
1 canette (1,8kg)	CAN	20€90			
1 pigeonneau (450g)	PIG	9€65			
blancs de poulet (500g)	BLC	9€80	9,80	9,80	19,60
foies (300g) sous vide	FOI	4€25			

Intermediate food value chains take the best of short and long.



Concepts of alternative food value chains



- many different concepts and empirical examples of alternative food value chains
- depending on their characteristics and size, ***short*** or ***intermediate value chains***

Graph based on Fleury et al. 2016, p.5

Working definition

- Cooperation
- Small and medium size actors
- Network
- High quality regional food
- Beyond the local market
- Fair distribution of value
- Innovation
- Common values
- Collective governance
- Transparency and trust
- Regional/interregional level
- Few intermediaries

*Intermediate food value chains are characterized by the **cooperation** of mainly **small and medium-sized actors** - from farmers, to processors, distributors, retailers, supporting organizations, other enterprises and consumers along the food value chain in a **network or strategic alliance.***

*Together they supply **high-quality regional food products** to consumers beyond the local market **in greater quantities** with facilitated access for consumers.*

*Intermediate value chain aim at creating **win-win situations for all actors** involved, through **collaboration**, by **fair distribution of value created** and the implementation of technological, social and organizational **innovations** in the food value chain.*

*The actors commit to common **values**, **collective governance** and are **creating trusted and transparent relationships.***

*Operation and distribution is at **regional to interregional level** with **fewer intermediaries** than in long VCs, but **minimum one intermediary**.*

Innovations to support IFVCs.

- **TECHNOLOGICAL**
  - **flexible filling machine** to reduce environmental footprint
  - **ICTs: GPS tool** to localize wild berries **& blockchain technology** to improve traceability and transparency
  - **Valorization of streams currently considered as waste:** whey, fruit & vegetables, and pits
- **SOCIAL**
  - **Sharing of processing equipment and/or infrastructure**
  - Logistical models **which reduce the consumption of packaging** (returnable packaging)
  - **Innovative funding systems** based on philanthropic income streams
- **ORGANIZATIONAL**
  - **food innovation incubators** to support a sustainable economic development of regions

TECHNOLOGICALLY INNOVATIVE!

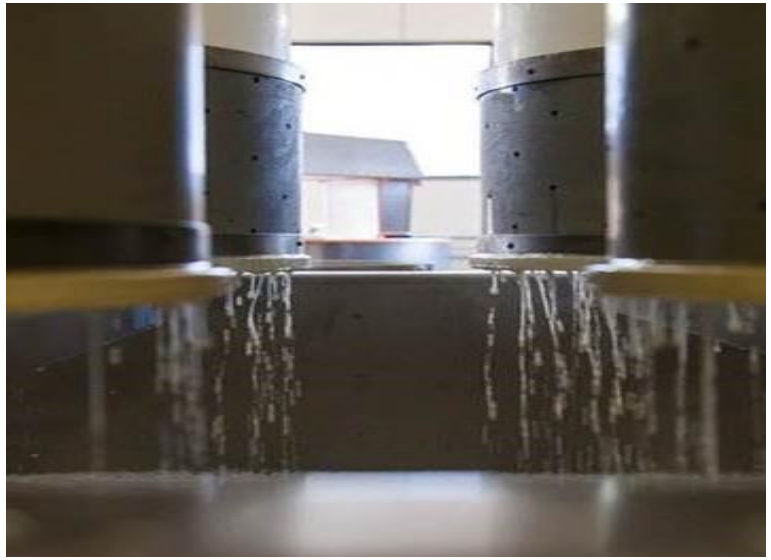
Innovations: Blockchain technology

A third of consumers increased cheese consumption during the pandemic!

- a QR code tells consumers the origin of their cheese and when, where and how it was produced
- supports local actors to standardize their services
- enhances trust of the consumers by improving traceability and transparency.

TECHNOLOGICALLY INNOVATIVE!

Innovation: “Waste” streams for food / cleaning



- Whey to develop beverages
  - whey from three cheeses tested for taste and other organoleptic properties
  - Now testing flavors to add to whey drinks.

- Fruits & vegetable unfit for consumption to produce alternative cleaning agents

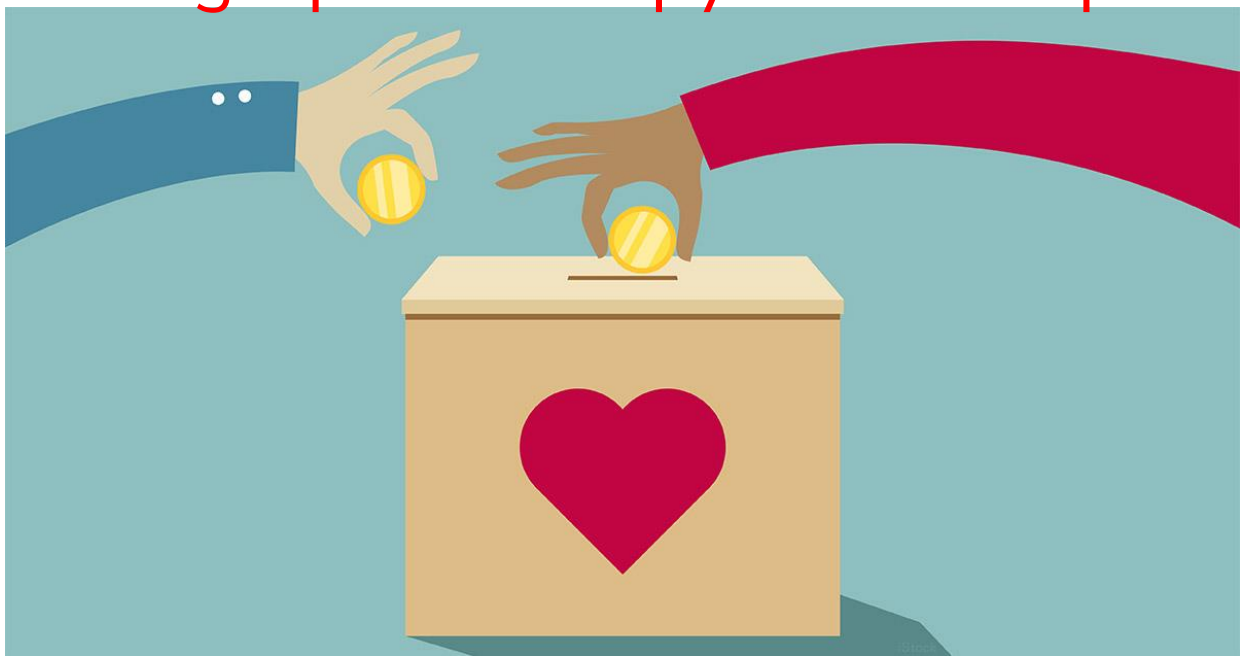
- Pits valorized via pyrolysis

10% malt vinegar can rapidly and completely inactivate influenza virus!

Innovations: Funding sources

- innovative business models based on philanthropic funding systems.

Strategic philanthropy boosts impact



news.cuna.org

SOCIALLY INNOVATIVE!

ORGANIZATIONALLY INNOVATIVE!

Innovations: Food incubator

Smallholder farmers produce 70–80% of the world's food!

- a place where actors of the food value chain have access to innovation, knowledge and services
- a co-design approach for sustainable economic development of regions and to create and expand food businesses

Innovations : A hygienic, flexible, and portable filling machine

reduce environmental footprint with green/sustainable packaging materials

- adapted
  - to the products
  - to changing quantities due to seasonal variation
- can be shared between producers

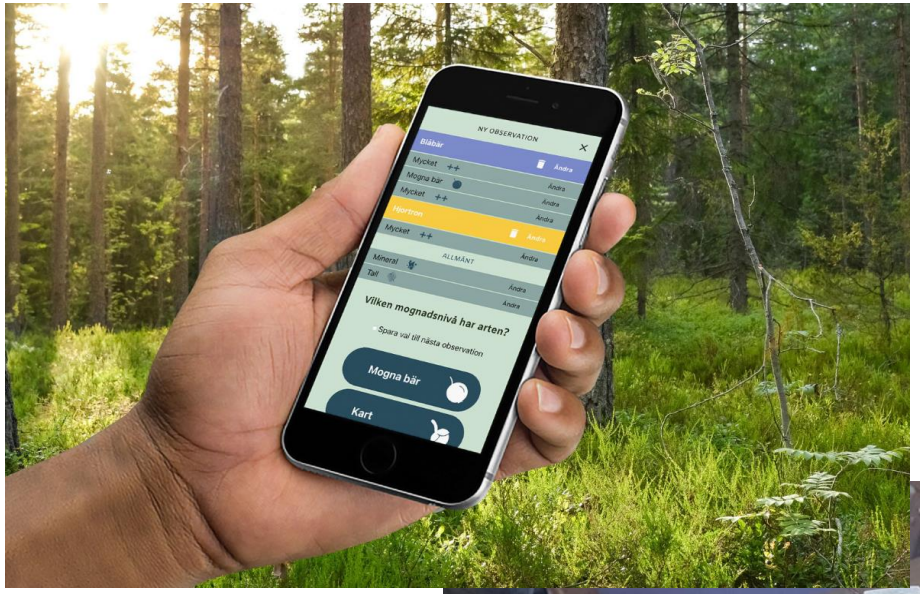
TECHNOLOGICALLY and SOCIALLY INNOVATIVE!

Reduce, reuse, recycle and RETHINK!

TECHNOLOGICALLY and SOCIALLY INNOVATIVE!

Innovations: GPS tool

A mere 2–5 % of berries in Swedish forests are picked!



- Berry pickers can easily find the location of wild berries in the Sweedish forests
- more local people pick berries
- help local berry companies to develop.
- Tested by the users in spring/summer 2021

Innovations: Innovation Platform

Select Language

SMARTCHAIN
SMART SOLUTIONS IN SHORT FOOD SUPPLY CHAINS

HOME | INNOVATION HUBS | INVENTORIES | NETWORKING | TRAINING | GAIN MODEL | REGISTER/LOGIN

Sustainable Food System Innovation Platform

The central objective of the SMARTCHAIN Project is to foster and accelerate the shift towards **collaborative short food supply chains** (SFSC) and, through specific actions and recommendations, to introduce **new robust business models** and **innovative practical solutions** that enhance the competitiveness and sustainability of the **European agri-food system**.

After the official end of the SMARTCHAIN project (31/08/21), 5 new H2020 projects (CO-FRESH, FAIRCHAIN, & PLOUTOS (RUR-06-2020) and LOWINFOOD & FOODRUS (RUR-07-2020)) will continue the maintenance and growth of this Innovation Platform with their results, findings, and contributions. These projects work to increase the competitiveness and sustainability of agri-food value chains through innovations, new approaches and effective ways to reduce food losses and waste. Stay connected to the Innovation Platform to keep up with all of the latest on innovative food systems!

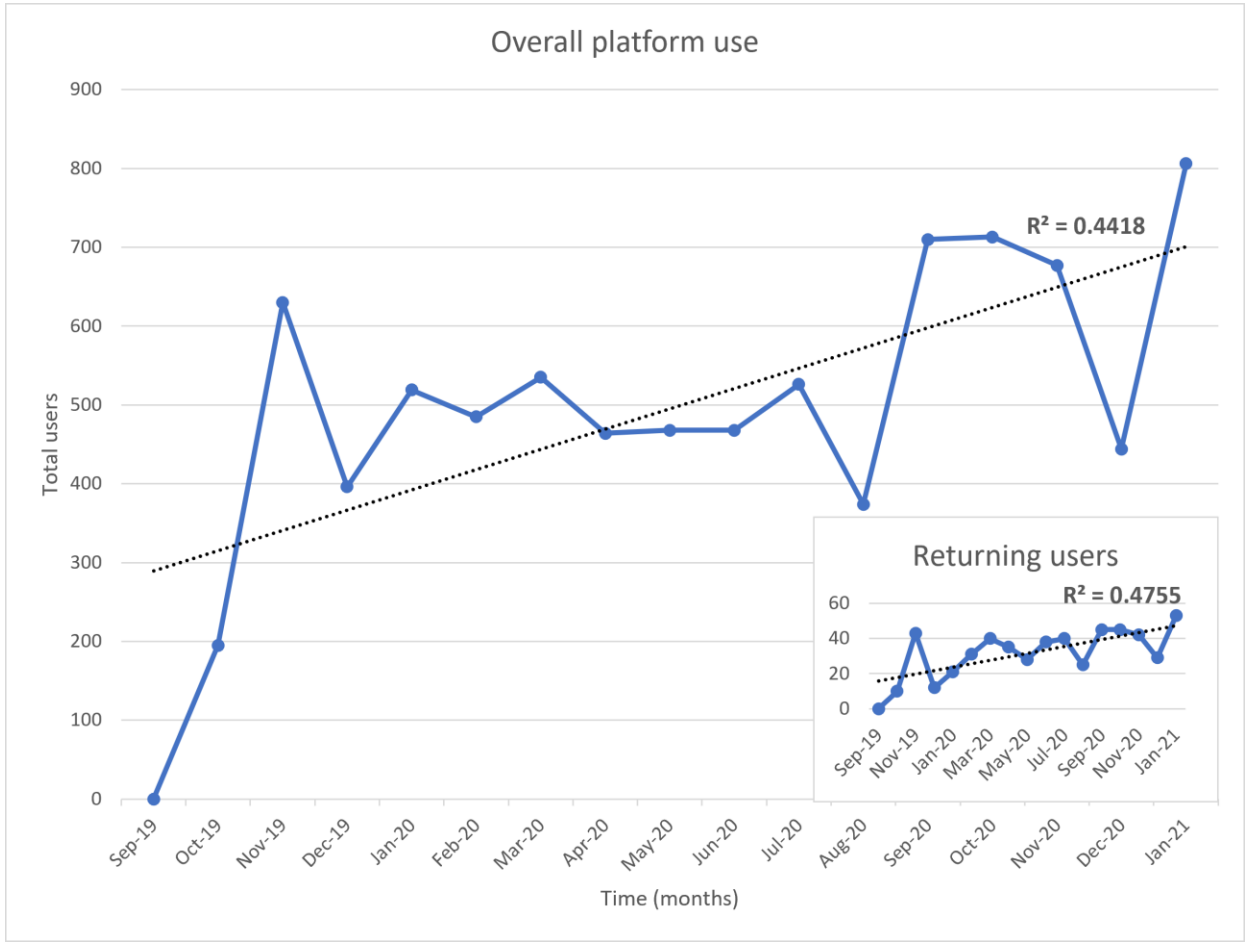
The SMARTCHAIN Innovation Platform facilitates knowledge, innovative practical solutions and know-how transfer. Particularly, the Platform aims to:

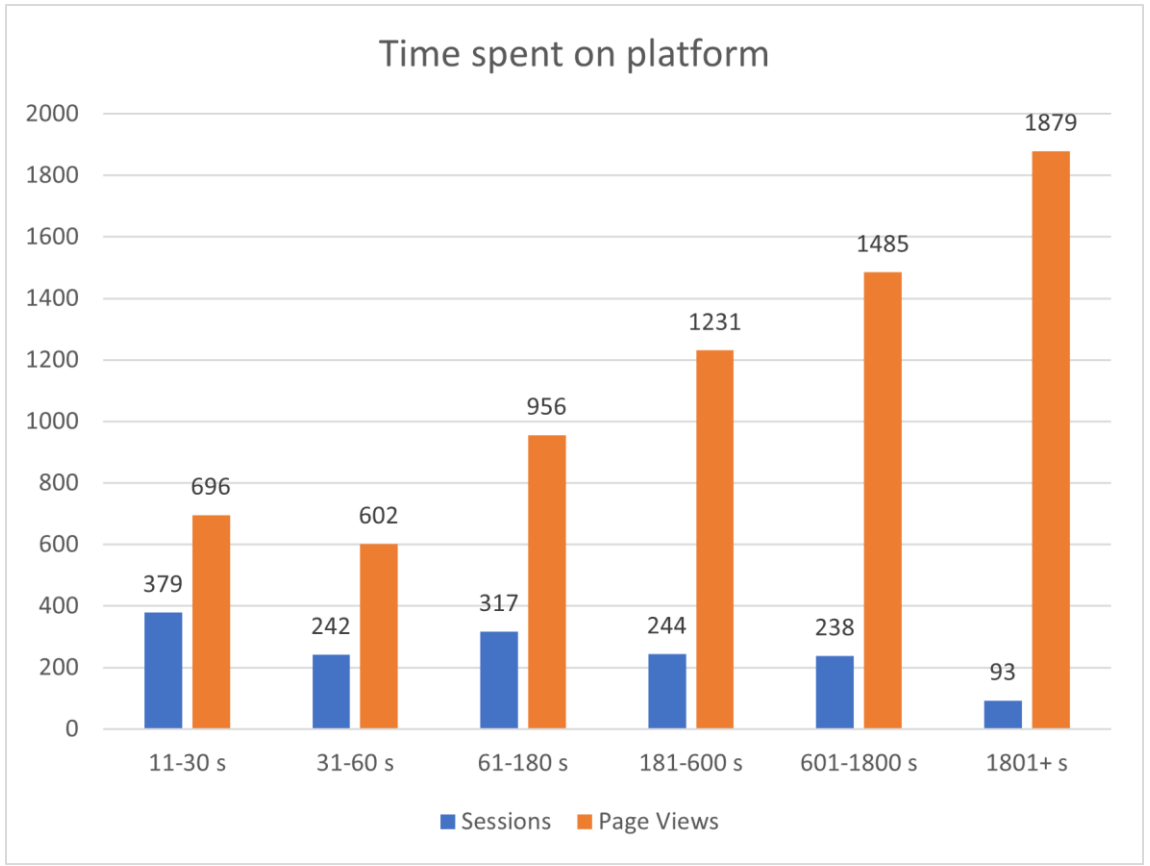
- Generate, share and utilize information on suitable innovations;
- Engage stakeholders in the SFSC sector;
- Disseminate SFSC innovation and cooperation events;
- Organize training activities and generate training materials on best practices in innovation;
- Build an international community through a short food supply chain game.

You can **help us improve our Platform** by answering a short online **questionnaire**!

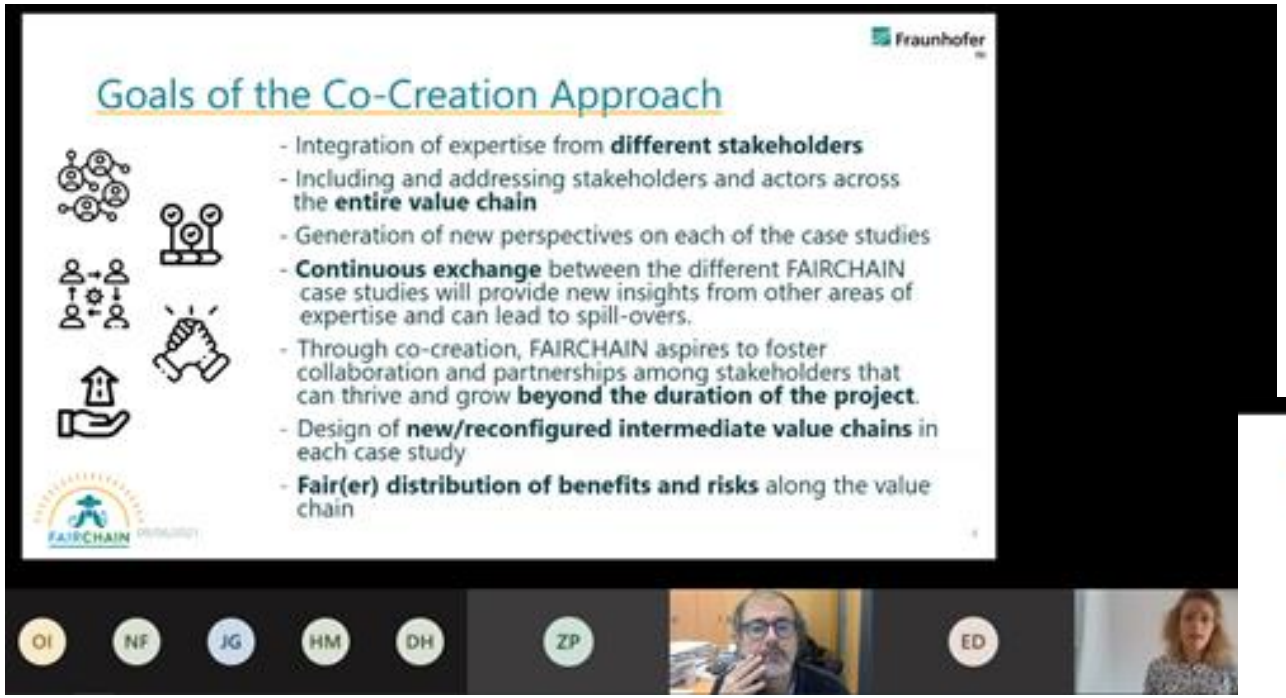
FAIRCHAIN

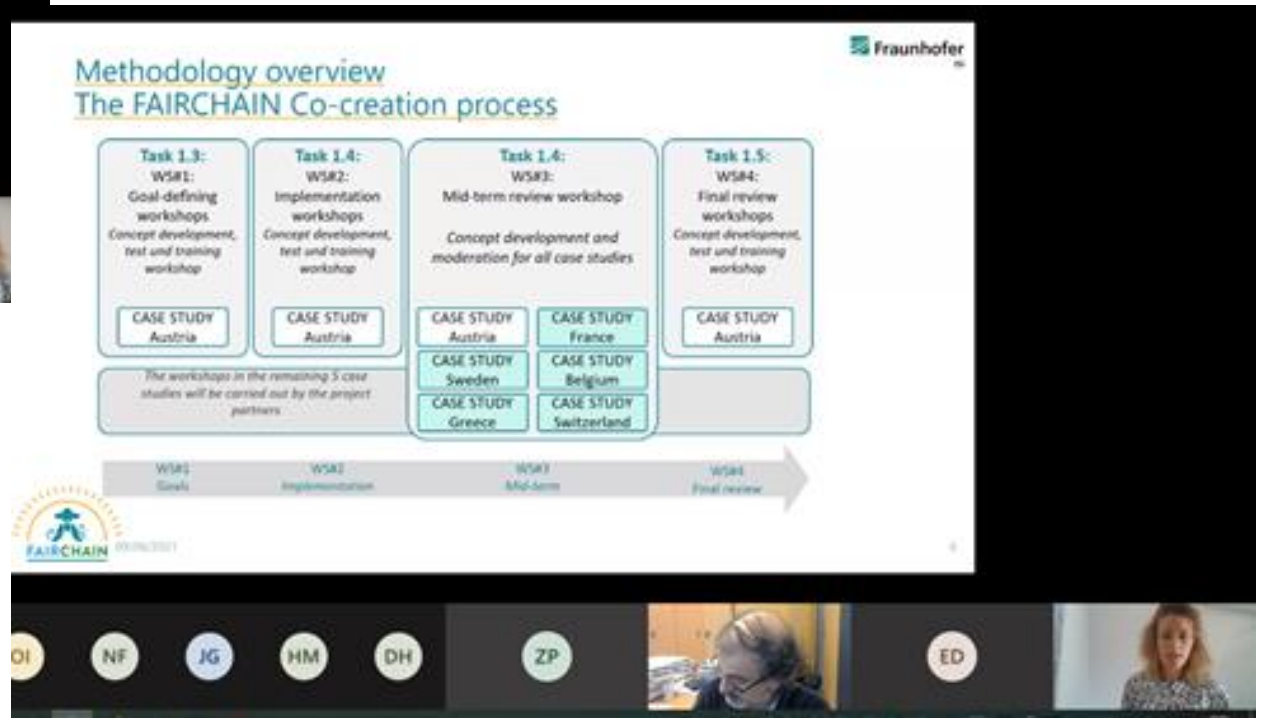
Innovations: Innovation Platform





Stakeholder input to test and improve innovations





FAIRCHAIN

FAIRCHAIN is HOT

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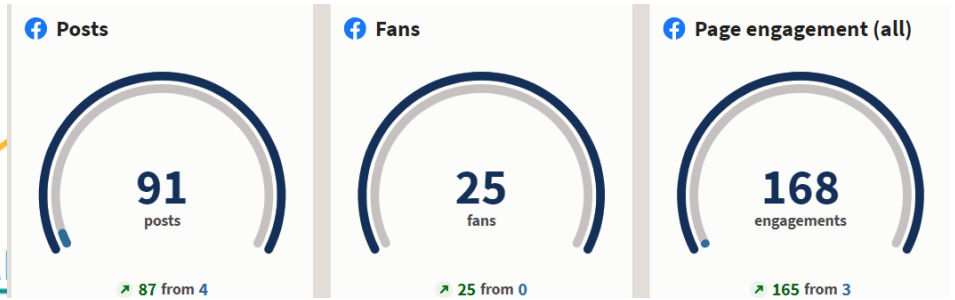
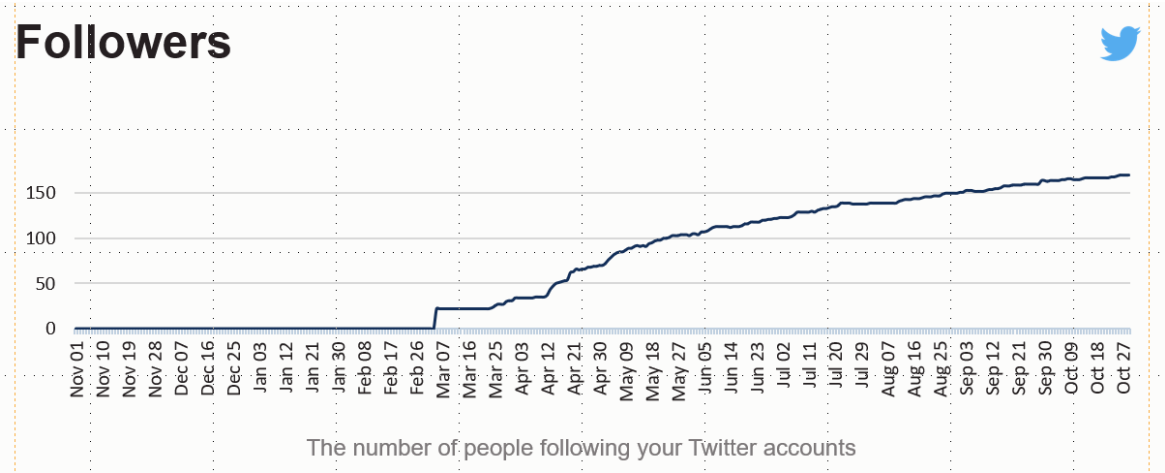
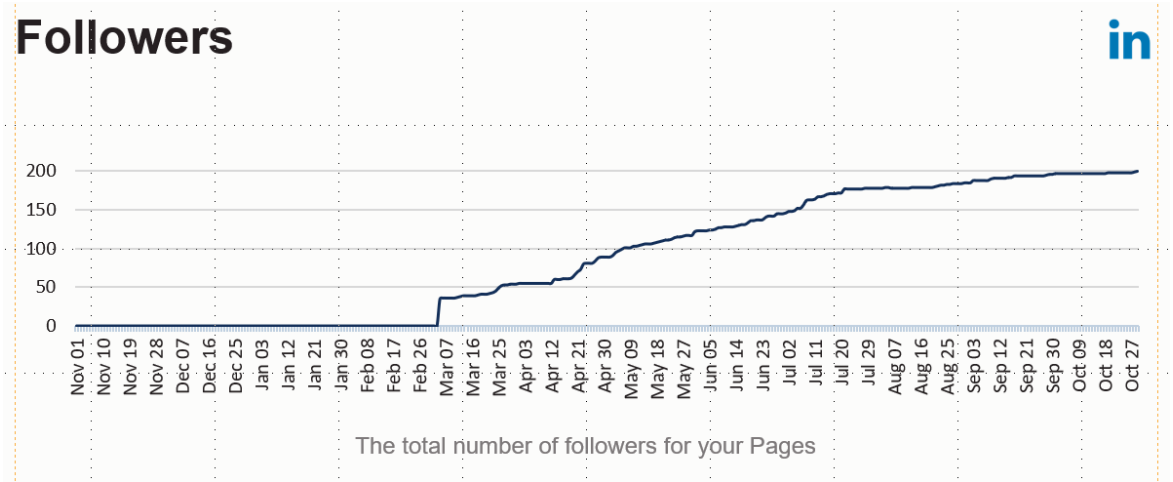






Project ID card

Acronym	FAIRCHAIN
Title	**Innovative technological, organisational and social solutions for FAIRer dairy and fruit and vegetable value CHAINs**
Topic RUR-06-2020	Innovative agri-food value chains : boosting sustainability-oriented competitiveness under the programme SC 2 "Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy"
Budget & funding	Overall budget: 8 036 566 € EU contribution: 6 996 636 €
Duration	1 November 2020 – 31 October 2024 (48 months)
Consortium	20 partners from 8 countries

Objective

Enable small and mid-size farmers and food producers to scale up and expand production of nutritious food through **competitive intermediate value chains** at the local and regional level.

SPECIFIC OBJECTIVES

Test, pilot and demonstrate **technological, organisational, social innovations** that have the potential to facilitate the aforementioned objective.

Deliver a **set of innovations** at technology readiness level (TRL) 7.

Develop **business models** associated to these innovations and carry out environmental, social and economic impact assessment.

Formulate **recommendations,** create **tools and guidance documents** to ensure uptake and replicability of value chains developed within FAIRCHAIN.

Technological innovations

- **Flexible filling machine** using green/sustainable packaging materials; designed to fulfil hygienic requirements; and adapted to short up to long production run

- **Emerging postharveted technologies adapted to co/by-products**
  - Innovative beverages based on whey
  - Cleaning agent from fermentation of unfit for consumption co-products from food and vegetable processing
  - Co-product (kernel) valorisation via pyrolysis

- **Information & Communication Technologies (ICTs)**
  - GPS tool to effectively localise wild berries
  - Application using blockchain technology to select, retrieve and interpret measurable data from operational processes

FRANCE

Production of innovative dairy drinks or desserts based on co-products of cheese manufacturing

- **Current situation requiring improvement**
  - Whey, a by-product of cheese production, is not sufficiently exploited.
  - Small producers need to generate revenue from whey. However, collection is difficult as they are often isolated
  - Small producers cannot afford the installation of bottling lines needed to produce whey-based drinks.

- **Main activities in FAIRCHAIN**
  - Use whey to develop valuable products, in particular healthy whey-based drinks.
  - Bring a zero-waste aspect to the distribution of fresh/room temperature liquid products.

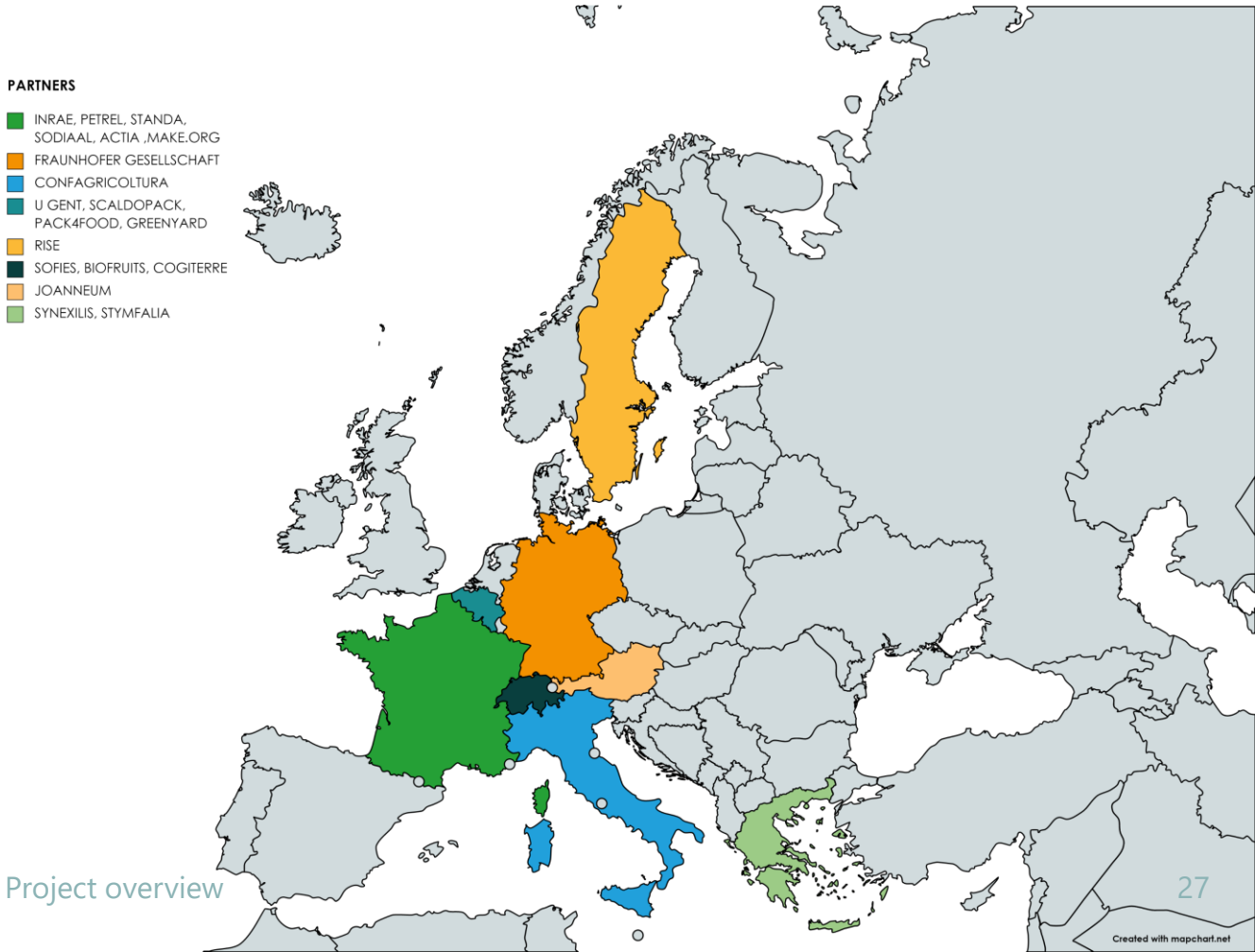
Organisational/social innovations

- **Sharing of processing equipment and/or infrastructure**
- **Logistical models** which reduce the consumption of packaging (returnable packaging)
- **Innovative funding systems** based on philanthropic income streams
- **Food innovation incubator** for co-creation of solutions by different actors in a regional value chains.

Consortium

Research	INRAE, RISE, FH JOANNEUM, Fraunhofer-Gesellschaft, Universiteit Gent
SMEs	Scaldopack, Petrel, Laboratoires Standa, Sofies SA, Biofruits SA, Cogiterre SARL, Synexilis, Stymfalia
Industry	Pack4Food, Greenyard, Sodiaal
NGOs	Confagricoltura, ISEKI-Food, ACTIA, Make.org

A multidisciplinary partnership including **20 organisations** in **eight countries.**



Linked third parties


STRATEGY

Approach

1. Map innovations that could contribute to the development of intermediate food value chains
2. Test in real-life conditions of a minimum of eight innovations through six case studies
    - The six case studies represent a value chain in the fruits, vegetable or dairy sectors involving small and mid-sized actors in a specific territory facing an unsatisfactory situation.
3. Formulate recommendations based on results

Co-creation with multiple food chain actors

Multi-perspective analysis that considers technological, organisational and social innovations

Multi-stakeholder validation

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